Secretary's Summit on Math – 3/13/03

Table notes from:
Paloma Santiago-Adorno – CAHSEE
Ralph Cordell – CDC
Ed Bales – Actuarial Foundation
Jeanne Narum – Kaleidoscope Project
Michael Tomasello – Mesa

Improvement of Mathematics Instruction – Getting the Message Out

Morning Notes

Public Engagement Issues:
- Demonstrate the beauty of mathematics
- Convince people of the place and value of mathematics in society
- Convince people of the significance of mathematics to the local economy
- Help people to see the role of mathematics in everyday life
- Create a sense of national urgency
  - Not enough math teachers
  - Not enough math-proficient people in industry
- Demystify the concept of mathematics – everyone can learn math.

Public Engagement Strategies:
- Build a cadre of community leaders to lobby for mathematics
- Develop a road show for mathematics
- Develop a marketing and public relations strategy
- Build on successful programs and organizations (national models of success in engagement)

Motivate
- Provide career counseling for parents of young children
- Connect initiative at all levels
- Motivate at all levels

Problems
- Popular culture has a hostility toward mathematics
- Need for federal leadership in changing viewpoints
- Create role models in entertainment industry which embody values of mathematics
- Engage media to create positive attitude

TABLE DISCUSSION TOPIC

GOAL
To create a sense of national urgency so students perform at a higher level of math achievement.

STRATEGY
Develop a national marketing and public relations strategy.

REASONS
1. Quality of life.
2. Economic success.
3. Highly qualified technically diverse workforce.
4. Maintain the tradition of being a nation of explorers.
5. Build students' self-confidence.
6. Help people to see that math is fun and cool – Math is the language for a contemporary society.

ELEMENTS
1. Identify the publics and subgroups within these publics (including different age groups, genders, races.)
    a. Students
    b. Teachers
    c. Parents
    d. Industry and business
    e. Associations
    f. Policy makers
    g. University faculties
2. Identify best practices and those organizations that have proven successful in creating a sense of urgency leading to quality math/science education
3. Identify all existing resources that can support this goal. (Money, organizations, publications, strategies.)
4. Promote and encourage enhanced partnerships of "best tactics" to share in meeting the need of each audience. Create and identify "the national intersection."
    a. Create a national clearinghouse of opportunities for such cooperation.
5. Develop a national team of "best tactics" practitioners to <u>engage</u> within and beyond the community (all <u>publics</u> above)
6. Monitor and evaluate practitioners' team performance and award programs based on their **performance.**
7. Approach the private sector as a partner in both determining the requirements for math literacy and for funding the math urgency campaign (perhaps the media in particular).

Afternoon Wrap-up Session

Public Engagement
Linda Robinson
  President of the national middle level association

Three Main Issues
  Partnerships must have consensus and cooperation
    Consistent message
    Crisp, focused delivery
    Common language
    Sustainable model

  Why math matters
    Economic
    Social
    National security

  Lack of success in math/science by underrepresented populations
    Ideal of success by every student
    Equalize funding
    Comprehensive, multifaceted engagement strategies

Teacher Knowledge

Judy Wurtzel – Learning First Alliance

Three core issues:
  Pre-service
  Ongoing Professional Development
  Career Change Issues

Need teachers at k-16 level with the knowledge, skills, and positive attitude to be able to teach mathematics effectively for the needs of our modern technological society

Barriers:
- Students learn differently
- Teachers need to learn math
- Who is the public
- Many states are rewriting their teaching standards
- Teachers may not see the need for so much content knowledge
- Written curriculum, taught curriculum, and assessment should be aligned
- How do we measure success of professional development
- P.D. needs to be ongoing
- How can we replicate and scale up successful programs to institutionalize them.

- What can we do to make this initiative be more successful than those that have happened in the past?

Group II

Didn't like the disconnect among the three areas outlined as the issues.
Chose the issue of connection among all components of mathematics education.

Group III

Deliver the math content knowledge to pre-service teachers that will impact classroom performance.

Communicate to teachers (and thus to students) the excitement of mathematics.

Communicate the utility of mathematics. Develop problem-solving skills.

Deliver math content to future teachers through the use of people who can model excellence in math pedagogy.

The need for math content instruction to pre-service teachers has to be addressed at the certification policy level.

Group IV

Mathematics knowledge for teaching mathematics has to be better identified, because it is different from the mathematics of professional mathematicians.

Measure quality teaching, including measuring the quality of math instruction.

Developing a Research Base

Three main issues:
Curriculum and instruction
Cognitive foundations of mathematical competency
Assessment

Group I
What works for whom and in what context?

How can we increase teacher skills and knowledge?

What causes degradation in student performance in middle school and high school? Why does the gap increase at middle school?

Cognitive Foundations

- Teacher knowledge
  - Effects of teacher cognition on student learning
- Incorporating models of cognition to understand representations of mathematics
- Technical Issues

Assessment
- Using assessment to improve teacher performance
- Teacher training in the use of assessment and other data
- Identify gaps between high school achievement and college expectations
- Assessment is a tool for the improvement of student performance
- It exists to inform, not just to measure
- Increase alignment between what is actually being taught and what is being assessed
- Couple the assessment with more qualitative features about each student

Group II

Greatest concern is that we are at a point when we are planting our garden.

The data from no child left behind creates an enormous repository of data, and therefore an enormous opportunity to create new knowledge about math instruction.